

REMARKS

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

By this amendment, claims 22 and 29 have been amended and new claims 37 and 38 have been added. Upon entry of this amendment, claims 1-38 will be pending. Applicants propose to amend Figure 12 of the drawings as indicated in the accompanying Request for Approval of Drawing Changes.

§103 Rejection of Claims 1-2, 11-12, and 21

In Section 1 of the Office Action, the Examiner has rejected claims 1-2, 11-12, and 21 under 35 U.S.C. §103(a) as being unpatentable over Ryu et al. (U.S. Patent 5,572,733; hereinafter referred to as “Ryu”) in view of Wold et al. (U.S. Patent 5,386,568; hereinafter referred to as “Wold”). It is submitted that the Examiner has not provided a copy of the Ryu reference, but has instead provided a copy of Ryu et al., U.S. Patent 5,560,012. However, it appears that the rejections of this Office Action are based upon Ryu (5,572,733) and not upon 5,560,012. Accordingly, the rejection based upon Ryu (5,572,733) and Wold is respectfully traversed below. Similar comments with respect to Ryu apply to the rejections in Sections 2 and 3 of the Office Action.

As shown above, claim 1 of the present application calls for:

1. A data processing apparatus for executing an object-oriented operating system made up of a plurality of objects among which messages are communicated, said data processing apparatus comprising:

means for rendering an object, which has received a combining request message requesting addition of a predetermined object, to create a table data structure used for referencing to said predetermined object as a component object, and to initialize said table data structure with data of said component object, thereby constituting a composite object; and

means for creating a data structure of at least one said component object, registering the data structure in said table data structure, and registering a relationship between at least one message processing function possessed by said component object and a message interface for requesting the message processing function in the data structure of said component object.

Accordingly, in claim 1, in executing an object-oriented operating system, the data processing apparatus builds a composite object and a component object. The composite object has a table data structure initialized with data of the component object. The component object has a data structure in which a relationship between a message processing function and a corresponding message processing interface is registered. In addition, the data structure of the component object is registered in the table data structure of the composite object corresponding to the component object. Therefore, there is a specific relationship between the composite object and the component object and among the data and structures of these objects.

It does not appear that the Examiner has established how the cited combination of Ryu and Wold, as relied upon by the Examiner, discloses or suggests claim 1. In particular, it does not appear that the Examiner has established how the cited combination of Ryu and Wold discloses or suggests the specific relationship between the composite object and the component object and among the data and structures of these objects, as called for in claim 1. In rejecting claim 1, the Examiner has listed elements from claim 1, but the Examiner has not explained any relationship between the listed elements. However, claim 1 calls for several elements and defines an arrangement of or a set of relationships among the elements. Without any explanation

of how the cited references show the relationship between elements, it is submitted that the Examiner has only addressed part of claim 1 and so has not established how the cited references disclose or suggest the claim as a whole.

For example, in claim 1, three specific elements (among others) are called for: a table data structure of a composite object, a data structure of a component object, and a relationship between a message processing function and a message processing interface. Claim 1 also defines the relationship between these elements and so how data for these elements is stored. The relationship between a message processing function and a message processing interface is registered in the data structure of the component object. The data structure of the component object is registered in the table data structure of the composite object.

By contrast, in Section 1, it appears that the Examiner refers to portions of Ryu and Wold contending that these portions show specific elements of claim 1, but it does not appear that the Examiner explains how Ryu or Wold show the relationships called for in claim 1. The Examiner appears to refer to a “command link table” in Ryu as showing the table data structure. The Examiner appears to refer to a “table, input data structure, input/output” in Wold as showing the data structure of the component object. The Examiner does not appear to address the relationship between the function and interface. Instead the Examiner appears to refer to “a part register function is a function of registering the object parts in the parts attribute file” in Ryu as showing registering, to “the message to the method” in Ryu as showing a message processing function, and to a “table, input data structure, input/output” in Wold as showing a message interface. It does not appear that the Examiner explains any relationship or arrangement of the items pulled from these references to Ryu and Wold. While the Examiner has alleged that certain portions of Ryu and Wold show a table data structure, a data structure for a component

object, registering, a message processing function, and a message interface, it does not appear that the Examiner has addressed how these items are related or arranged. It does not appear that the Examiner has explained how Ryu and Wold show that there is a relationship between a message processing function and a message processing interface and that this relationship is registered in the data structure of the component object. It does not appear that the Examiner has explained how Ryu and Wold show that the data structure of the component object (including this registered relationship) is registered in the table data structure of the composite object. Without explaining how the references show that a relationship between a message processing function and a message processing interface is registered in the data structure for the component object and that the data structure of the component object is registered in the table data structure, it is submitted that the Examiner has only addressed part of claim 1.

Accordingly, it is respectfully submitted that the Examiner has not established how Ryu and Wold, as relied upon by the Examiner, anticipate or suggest claim 1, and so also has not established how Ryu and Wold, as relied upon by the Examiner, anticipate or suggest claims 2-10 and 37 that depend from claim 1. Similar arguments apply to claims 11 and 21, and so to claims 12-20 and 38 that depend from claim 11.

Based upon the foregoing, it is submitted that claims 1-2, 11-12, and 21 are not anticipated by nor rendered obvious by the teachings of Ryu and Wold, as referenced and presented by the Examiner. Accordingly, it is submitted that the Examiner's rejection of claims 1-2, 11-12, and 21 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

§103 Rejection of Claims 3-10 and 13-20

In Section 2 of the Office Action, the Examiner has rejected claims 3-10 and 13-20 under 35 U.S.C. §103(a) as being unpatentable over Ryu in view of Wold and further in view of Kavner (U.S. Patent 6,430,607; hereinafter referred to as “Kavner”). This rejection is respectfully traversed below.

Claims 3-10 depend from claim 1 and claims 13-20 depend from claim 11. As discussed above, it is submitted that the rejection to claims 1 and 11 in view of Ryu and Wold as presented in Section 1 of the Office Action has been overcome. It does not appear that the Examiner contends that the cited combination of Ryu, Wold, and Kavner discloses or suggests claims 1 and 11. Therefore, because claims 3-10 depend from claim 1 and claims 13-20 depend from claim 11, it is submitted that the rejection to claims 3-10 and 13-20 has also been overcome, and so it is respectfully requested that this rejection be withdrawn.

Furthermore, considering the rejection presented in Section 2 of the Office Action, it does not appear that the Examiner has established how the cited combination of Ryu, Wold, and Kavner, as relied upon by the Examiner, discloses or suggests claim 3. As shown above, claim 3 of the present application calls for:

3. A data processing apparatus according to Claim 1, wherein said composite object has a specific execution thread and executes message processing issued to said component object with said specific execution thread.

Accordingly, the composite object has a specific execution thread. Message processing issued to the component object is executed with that thread. The composite object and the component object share a thread, and so there is no thread context switch between the composite

object and the component object, or between two component objects of the composite object. Avoiding thread context switches can improve performance. See, e.g., the Specification of the present application at page 61, line 24 to page 62, line 4: "... when message communication is performed between component objects, the processing including the message queue operation, call of the 'scheduling policy' and switchover of the execution thread ... is omitted, thus resulting in a remarkably reduced communication cost."

It does not appear that the Examiner has established how the cited combination of Ryu, Wold, and Kavner discloses or suggests the composite object and the component object sharing an execution thread. In Section 2, it appears that the Examiner refers to Ryu and Wold as showing the composite object and the component object and to Kavner as showing thread execution. However, it does not appear that the Examiner has explained how the cited combination of Ryu, Wold, and Kavner shows a component object and the composite object for that component object sharing a thread. Instead, the Examiner states: "It would have been obvious to apply the teachings of Kavner to Ryu in order to perform only one object execute at a time." It does not appear that this statement supports the Examiner's argument for obviousness. Performing execution for one object at a time does not necessarily imply that objects are sharing a thread. In addition, it does not appear that the Examiner has explained what motivation there is in the cited references to "perform only object execute at a time."

Furthermore, the Examiner states: "Objects programmer did not worry about concurrency." This statement appears to imply that concurrency, and so the use of multiple threads or sharing of threads, was not an issue in object-oriented programming. However, if this were true, it appears that it would then be less likely for a programmer to modify Ryu with Kavner, as referenced by the Examiner, to have a composite object and a component object share

a thread because concurrency and so the use of threads is “not an issue.” Therefore, it appears that the Examiner’s statement supports that there is less motivation to combine Ryu and Kavner, as referenced by the Examiner.

Accordingly, it appears that the Examiner has not established how the cited combination of references discloses or suggests claim 3 and also has not established the motivation to combine Kavner with Ryu, as presented by the Examiner. Therefore, it is respectfully submitted that the Examiner has not established how Ryu, Wold, and Kavner, as relied upon by the Examiner, anticipate or suggest claim 3, and so also has not established how Ryu, Wold, and Kavner, as relied upon by the Examiner, anticipate or suggest claims 4-10 that depend from claim 3. Similar arguments apply to claim 13, and so to claims 14-20 that depend from claim 13.

Based upon the foregoing, it is submitted that claims 3-10 and 13-20 are not anticipated by nor rendered obvious by the teachings of Ryu, Wold, and Kavner, as referenced and presented by the Examiner. Accordingly, it is submitted that the Examiner’s rejection of claims 3-10 and 13-20 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

§103 Rejection of Claims 22, 23-25, 26-28, 29, 30, 21-32, 33-35, and 36

In Section 3 of the Office Action, the Examiner has rejected claims 22, 23-25, 26-28, 29, 30, 21-32, 33-35, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ryu in view of Kavner. It appears that the Examiner is rejecting claims 21-36 over Ryu in view of Kavner and this rejection is respectfully traversed below.

As shown above, claim 22 of the present application calls for:

22. A data processing apparatus for executing an object-oriented operating system, said data processing apparatus comprising:
 object constituting means for constituting objects, among which messages are communicated, by any of a composite object made up of one or more component objects and a standard object that is an object other than a composite object;
 identifier setting means for attaching an identifier to each of the standard object and the component objects constituted by said object constituting means so that each standard object and each component object are referenced from any object; and
 execution thread control means for executing one composite object by one execution thread for the composite object included in the objects constituted by said object constituting means, said execution thread being shared by each component object of the composite object.

Accordingly, in claim 22, a composite object is made up of one or more component objects. A composite object is executed by one execution thread. The composite object and each of the component objects making up that composite object share that execution thread. As discussed above referring to claim 3, by sharing a thread, there is no thread context switch between the composite object and the component object, or between two component objects of the composite object. Avoiding thread context switches can improve performance.

It does not appear that the Examiner has established how the cited combination of Ryu and Kavner, as relied upon by the Examiner, discloses or suggests claim 22. In particular, it does not appear that the Examiner has established how the cited combination of Ryu and Kavner discloses or suggests that the composite object and each of the component objects of the composite object share an execution thread. In Section 3, it appears that the Examiner refers to Ryu as showing the composite object and to Kavner as showing thread execution. It does not appear that the Examiner has addressed how Ryu and Kavner show the component object in Section 3. In addition, it does not appear that the Examiner has explained how the cited

combination of Ryu and Kavner shows a composite object and each of the component objects of that composite object sharing a thread.

In Section 3, the Examiner states: "Ryu does not teach execution thread being shared by each component object. However, Kavner teaches multiple remote requests within the same thread of execution ... It would have been obvious to apply the teachings of Kavner to Ryu in order to perform only one object execute at a time." It does not appear that these statements support the Examiner's argument for obviousness. Multiple requests within the same thread does not necessarily imply that multiple objects are sharing a thread. Performing execution for one object at a time does not necessarily imply that objects are sharing a thread. It does not appear that the Examiner has explained how the cited references show how the composite object and each of the component objects of the composite object are to share the thread. In addition, it does not appear that the Examiner has explained what motivation there is in the cited references to "perform only object execute at a time."

Furthermore, the Examiner states: "Objects programmer did not worry about concurrency." This statement appears to imply that concurrency, and so the use of multiple threads or sharing of threads, was not an issue in object-oriented programming. However, if this were true, it appears that it would then be less likely for a programmer to modify Ryu with Kavner, as referenced by the Examiner, to have a composite object and each of the component objects of the composite object share a thread because concurrency and so the use of threads is not an issue. Therefore, it appears that the Examiner's statement supports that there is less motivation to combine Ryu and Kavner, as referenced by the Examiner.

Accordingly, it appears that the Examiner has not established how the cited combination of references discloses or suggests claim 22 and also has not established the motivation to

combine Kavner with Ryu, as presented by the Examiner. Therefore, it is respectfully submitted that the Examiner has not established how Ryu and Kavner, as relied upon by the Examiner, anticipate or suggest claim 22, and so also has not established how Ryu and Kavner, as relied upon by the Examiner, anticipate or suggest claims 23-28 that depend from claim 22. Similar arguments apply to claims 29 and 36, and so to claims 30-35 that depend from claim 29.

Regarding claim 21, it does not appear that the Examiner explains the rejection of claim 21 over Ryu and Kavner in Section 3. Accordingly, it is respectfully requested that this rejection be withdrawn.

Based upon the foregoing, it is submitted that claims 22, 23-25, 26-28, 29, 30, 21-32, 33-35, and 36 are not anticipated by nor rendered obvious by the teachings of Ryu, Wold, and Kavner, as referenced and presented by the Examiner. Accordingly, it is submitted that the Examiner's rejection of claims 22, 23-25, 26-28, 29, 30, 21-32, 33-35, and 36 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

Conclusion

In view of the foregoing, entry of this amendment, and the allowance of this application with claims 1-38 is respectfully solicited.

In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, are patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes to these claims, as presented herein, are not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes are

made simply for clarification and to round out the scope of protection to which Applicants are entitled.

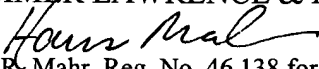
In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicants' representative at the telephone number written below.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,

FROMMER LAWRENCE & HAUG LLP

By:



Hans R. Mahr, Reg. No. 46,138 for
William S. Frommer
Reg. No. 25,506
(212) 588-0800

FIG. 12

